

September

2016

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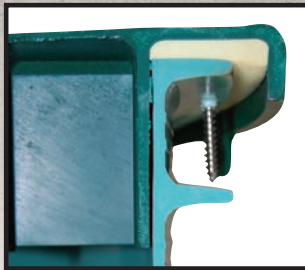
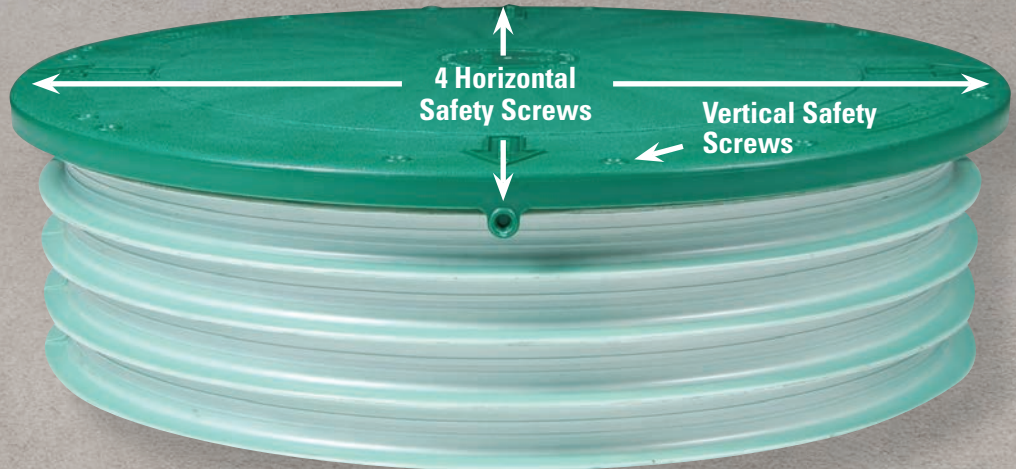
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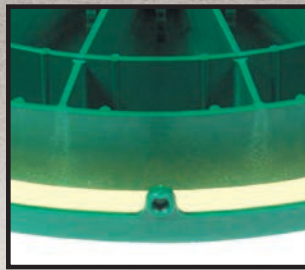
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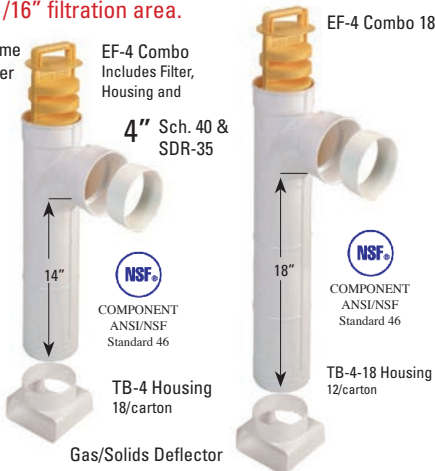


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Kudos to the Industry Pit Bulls

It's great when an installer or designer raises a voice to right wrong information being circulated about the onsite industry

By Jim Kneiszel



When it comes to painting an accurate picture on behalf of the onsite industry, we need a whole lot more pit bulls like Eric Larson — experts and supporters willing to grab onto a message and refuse to let go until the general public has a better understanding of what installers do.

Larson, a former system designer and advanced system service provider in Milaca, Minnesota, forcefully took control over a local debate when he saw misinformation discrediting the value of onsite wastewater treatment. Responding to two editorials in the local media, Larson stood up for much-maligned decentralized wastewater treatment in the face of a proposed municipal sewer extension. And we should be proud of him jumping in to counter ignorance.

First, a commentary in the *Mille Lacs County Times* near the Twin Cities failed to grasp one reason for a steep drawdown of the water level on White Bear Lake, a large, popular lake in suburban St. Paul, Minnesota. Then a school superintendent promoting extension of a municipal sewer pipe to allow for a school building project implied that septic systems do not protect the groundwater aquifer. Being familiar with both situations, Larson couldn't let the issues go unanswered.

"The last thing we need are stories like this that distort and don't tell the whole story. We need to be ambassadors for what we do. If we can't be ambassadors for what we do for a living, that's a red flag."

Eric Larson

ONSITE A BETTER WAY

In his letter, Larson noted that the school superintendent's swipe at septic systems is a common misunderstanding. It's a lingering criticism based not on the quality of decentralized wastewater treatment, but that great need to regulate and maintain private, individual systems.

"Properly designed, installed and maintained septic systems do protect both surface and groundwater," Larson wrote. "In fact, because septic systems discharge into soil, they are designed to treat to a higher standard than municipal wastewater treatment plants, which discharge to surface water and can include dilution as part of the final treatment."

Regarding the aquifer depletion at White Bear Lake — which has seen a drawdown of several feet over the years — Larson pointed out that fully developed municipal sewer around the suburban lake is part of the problem. He said that well-maintained septic systems would have returned clean water to the local aquifer instead of the sewer pipe diverting downriver.

"White Bear Lake has essentially been sent to the Gulf of Mexico via the Mississippi River," he wrote. "Imagine the millions/trillions of gallons of freshwater that was under White Bear Lake and has been systematically sent to the ocean over decades."

SALT IN THE WOUND

I reached out to Larson — now developing a new remote monitoring system for the septic service industry — to ask how he decided to get involved in these local issues. He said he's grown weary of the "If it's sewer, it's safe" message and needed to speak out for the onsite industry.

"You don't need this kind of salt in the wound," Larson says. "The last thing we need are stories like this that distort and don't tell the whole story. We need to be ambassadors for what we do. If we can't be ambassadors for what we do for a living, that's a red flag."

Lost on the general public is the message that Minnesota discharge regulation of the onsite industry is far more stringent than that of municipal treatment, Larson contends. While septic systems have to meet a 10 mg/L of nitrogen standard before being released into the soil, municipalities aren't required to meet those standards for surface discharge. People don't realize dilution is a factor in discharge to waterways, and that dilution also exports water that could replenish local aquifers.

Message one is that properly working septic systems treat wastewater better. And message two is that septic systems in places like White Bear Lake would keep water local.

"In general, the concept of conserving groundwater is very little known, disturbingly so," Larson says. He believes the drawdown of White Bear Lake, for example, may have been averted if well water had been used, treated and allowed to return to the local aquifer.

WE'RE COST-EFFECTIVE

Cost of treatment is another issue where education is key, according to Larson. There needs to be a new attitude that onsite can be a permanent

solution to wastewater treatment rather than the 20th century perception that “septic is what you did until you got sewers.”

Contrary to common perceptions, lifetime cost calculations ultimately favor onsite treatment over the Big Pipe, Larson says. If you build today’s systems to be a permanent solution and implement regular maintenance plans, the design life will be extended and cost homeowners less in the long run than sewer hookup and monthly bills, he says.

Sara Heger, a Ph.D. engineer and researcher at the Water Resources Center at the University of Minnesota, understands Larson’s motivation to try to educate the public about the advantages of onsite. She is frequently called on to correct misinformation or oversimplifications when onsite issues arise in Minnesota and beyond.

“Once a month I see something that makes me say the true story isn’t being told here,” Heger says. “What we’re doing every single day is trying to educate people about their septic systems and the additional benefits they provide as opposed to centralized systems.”

A recent example is a series of Minnesota Public Radio reports about water quality on some of the state’s most popular recreational lakes. There is a tendency to blame septic systems for the problem and point to expensive municipal treatment as a solution. But in reality, if the blame falls on septic systems, it’s systems that have failed, and often municipal treatment isn’t a cost-effective option. And there are other factors, like agricultural runoff or other nonhuman sources, that may be to blame, she says.

As for the knocks onsite has to endure, Heger says, “If someone heard this they would think septic systems around lakes would be a bad thing. But we don’t know what it would look like if we had compliant systems around the lake.”

IT’S GETTING BETTER

Heger credits busy installers who take the time to respond to criticism of the onsite industry. “How do we as an industry stay on top of all of these things? It’s all you can do to be involved in your local community.” That’s where installers can lean on their state and national trade associations and professional educators for help.

It’s not all negative news. The onsite message is starting to come through, Larson says. He cites lobbying efforts from the National Onsite Wastewater Recycling Association and recognition by the U.S. Environmental Protection Agency that onsite is part of a national wastewater solution as positives.

“People are becoming more accepting of septic systems. They realize it’s an infrastructure and it’s much different than it was 25 years ago,” he says. “There are a lot of really good, well-trained

operators in our industry now. We have a fully developed code in Minnesota. Contractors for the most part are doing a very good job. The percentage of noncompliant systems in Minnesota has dropped dramatically over 20 years.”

But that doesn’t mean we can rest on our laurels. The industry needs a voracious pack of pit bulls to pin their ears back and stay on message. A bright future for the onsite industry depends on it. ■

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UNEXPECTED DAMAGES

Catastrophe Creates Tough Job

For this month's cover star Bob Willis, replacing failed seepage pits is routine. However, unique circumstances turned one such repair into a job so tough, it took seven months to see it through to completion. Check out the details in the exclusive online story. onsiteinstaller.com/featured



SEPTIC CARE

Testing for Quats

There are literally hundreds of quats in existence and in common use in home, commercial and industrial products. And they can be toxic to septic systems, which your customers probably aren't aware of. Here's some information you can pass on to homeowners to help them care for their systems. onsiteinstaller.com/featured



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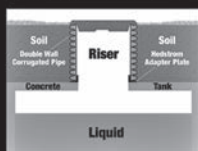


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Rodeo roper and septic service pro Bob Willis casts a line and pulls in a huge workload replacing onsite systems, performing inspections in rugged Southern California

By Scottie Dayton | Photos by Collin Chappelle

Cutting his teeth in the construction trade, Bob Willis struck out on his own in 2004 when he and his wife, Terri, opened Bob's Septic Service in Escondido, California. Willis and two employees installed onsite systems for a home developer, then transitioned to system repairs after the 2008 economic crash.

"My destiny changed in 2015 when I entered into a long-term licensing agreement with Arrow Pipeline and Pacific Drain to use the name R.F. McKenna Construction," says Willis, age 57. "Suddenly, we were growing so fast that it was overwhelming." His business doubled in 18 months, and may triple this year.

Through it all, Willis developed a specialty for replacing failed seepage pits commonly employed to treat residential wastewater for San Diego County's coastal region. He also built many solid professional relationships — with other contractors and in the real estate world — to broaden the scope of his business.

MAKING CONNECTIONS

Punching cattle on his father's ranch in Valley Center, California, Willis learned the value of hard work, handshake relationships, common sense and staying out of debt. From eight years running a finish bulldozer for Basil Construction, Willis learned to leave job sites presentable. "Homeowners never know we've been there other than now their toilets flush," he says.

Bob's Septic Service, Escondido, California

OWNERS:	Bob and Terri Willis
YEARS IN BUSINESS:	12
EMPLOYEES:	10
SERVICES:	Residential and commercial onsite installations, maintenance, repair, pumping, jetting
TERRITORY:	San Diego County
ASSOCIATIONS:	San Diego County Waste Haulers Association, Better Business Bureau
WEBSITE:	www.bobssepticseviceinc.com



A relationship formed while rodeo team roping led to Willis' independence. In 2004, the housing industry in northern San Diego County was booming and Bub Akans, a fellow roper and septic contractor, suggested Willis help as a subcontractor. "I bought a used 416 Caterpillar backhoe, opened my business, and worked with Bub for two years," says Willis. "He

<<OPPOSITE PAGE: The Bob's Septic Service crew includes, from left, Lane McIver, Dominic Garcia, Salvador Morales, Brad Groff, Bob Willis, Dave Page, Todd Durham, DeeDee Brink, Tina Rousseau and Jonette Durham. In the background are the company's two vacuum trucks, a Hino with an NVE pump from House of Imports and a Peterbilt with an NVE pump from Lely Tank & Waste Solutions.

was my mentor and cheerleader, even after I earned my installer license in 2006." Willis also hired Salvador Morales as a pipelayer that year.

Willis was soon installing new systems for a home developer and doing septic repairs for customers referred by Eric de Jong, owner of Diamond Environmental Services. Then his office manager and Realtor Jonette Durham suggested another key to growing the company: focus on real estate home sales, because septic inspections often uncovered needed repairs.

Willis attended real estate meetings, sponsoring the room or providing breakfast as his invitation to talk briefly about his business and help agents with septic issues. His down-to-earth approach reassured the Realtors and their clients, he explains.

The collapse of the housing market spurred the company to new heights. Although California has no standards for septic inspection, many national lending institutions and most large mortgage companies required inspection and certification before making loans. Durham's father, a Realtor and team roper, asked Willis who to call to inspect the septic system for a property he was listing. The agents, he said, were looking for a trusted contractor who wouldn't find something wrong with every system.

Willis began inspecting and certifying systems following the San Diego County Waste Haulers Association guidelines. "My relationship with Realtors has achieved outstanding results," says Willis. "Today, we do three or four inspections a week, and half the systems need something fixed."

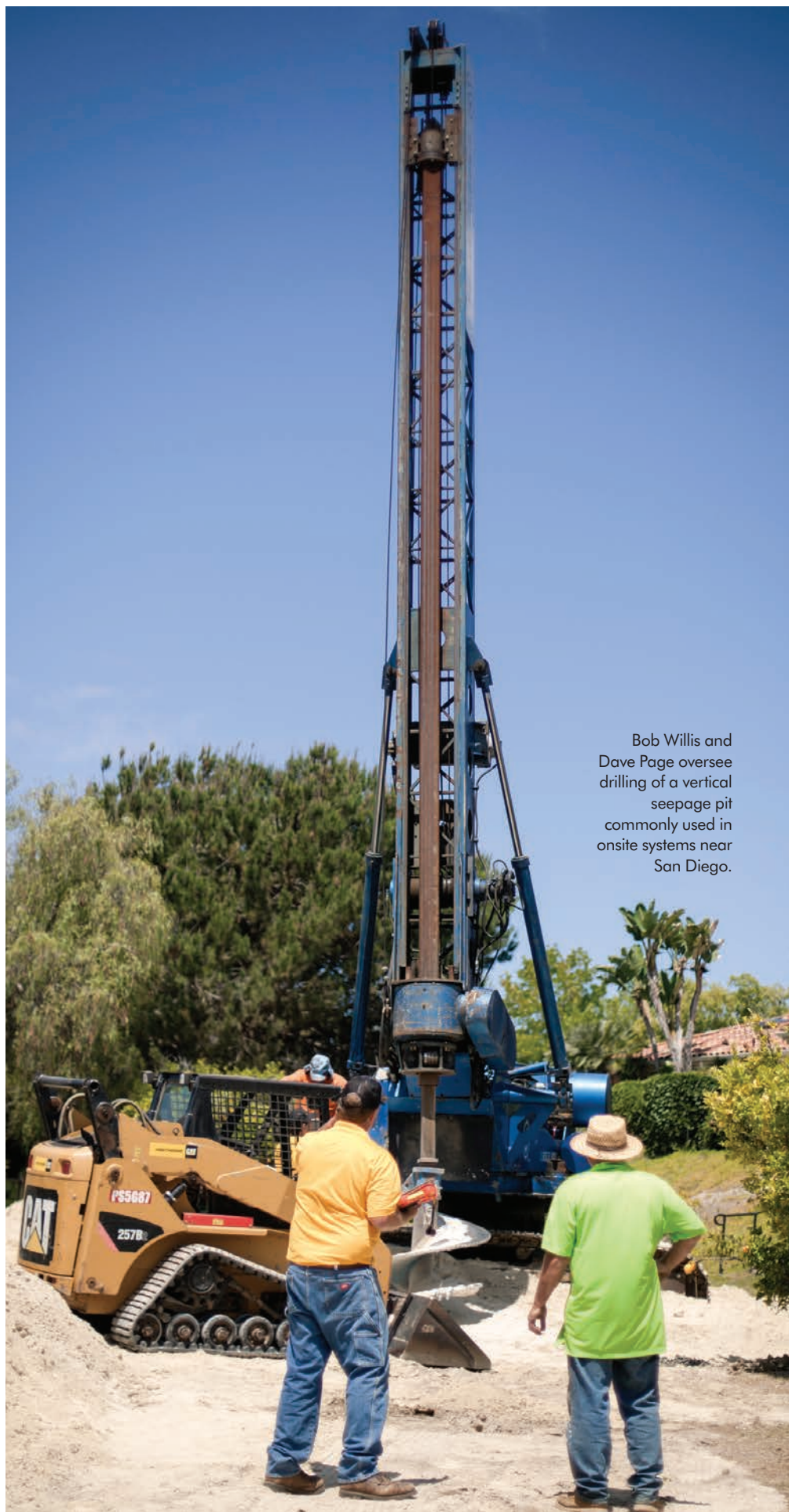
Short-sale homes left vacant for many months are Willis' greatest inspection challenge, because the systems are dry. Had they failed before drying out, the receiving soil would be clogged from the viscous fluid released by dying bacteria. "We are extremely careful to evaluate the soil type," says Willis. "We even pothole leach lines looking for signs of excessive biomat."

ON THE JOB

Repairs drove the company's revenue, with only 20 percent generated by new installations. Replacing failed seepage pits remains the most common repair. Biomat forms on the bottom of pits in one to two years, but as the column of effluent rises, hydraulic pressure pushes water

"We are extremely careful to evaluate the soil type. We even pothole leach lines looking for signs of excessive biomat."

Bob Willis



Bob Willis and Dave Page oversee drilling of a vertical seepage pit commonly used in onsite systems near San Diego.

Bob Willis watches as a county environmental health inspector confirms the depths of several vertical seepage pits bored out by a drilling contractor in a San Diego suburb.



TALL IN THE SADDLE

Before opening the doors of Bob's Septic Service, owner Bob Willis is in the gym at 5 a.m. daily. Workouts help manage stress, but also keep him fit to compete in rodeo team roping.

In the timed event, contestants start from a box on either side of a steer in a chute. When the steer is released, a string attached to its neck breaks the rope barrier stretched across the first rider out — the header, who tries to rope the animal's head or horns. Once the catch is made, the header turns the steer left for the "heeler" — Willis' role. He ropes the steer's hind legs, the more difficult of the two tasks. Willis then backs his mount to stretch the steer slightly between the two horses. When both ropes are taut, the clock stops.

Willis has steers and an arena on his property, and practices at least three days a week. "I'm home by 5 or 6 o'clock, saddle B.C. or Drover — both Quarter horses — and rope with my wife, Terri, or some of the guys from work until dark," says Willis. "We also have a company barbecue at the house, and we all rope and visit and have a good time."

Most weekends are spent at team roping competitions. During the first quarter of this year, Willis and Terri have won trophy saddles in a husband-and-wife event. Bob also won a trophy saddle competing in Phoenix, Arizona, and was high money winner at the annual Ropes Galore Customer Appreciation Team Roping and Barrel Race in Ramona, California. "I brought home a trophy buckle and an ice chest," says Willis. "Curtis Nelson and I roped our steers for an average time of 19.25 seconds. We're very blessed to win every now and then."

through the biomat. Eventually, the biomat clogs and the rising column pushes effluent through the walls. Many years pass before the water column shows any activity, then it begins to rise rapidly. Once the pit is almost full, it begins to fail and a new one is drilled.

Most systems along the San Diego coast have septic tanks draining to 4-foot-diameter vertical seepage pits. This area has a deep layer of heavy clay in which percolation rates might exceed 120 minutes per inch. Furthermore, the topography is hilly with bluffs, requiring capped pits. The cap depth is the distance from the surface to the discharge pipe's invert. "Slopes can cause cap depths to be 20 feet deep with 80 feet of pit below them to reach the receiving soils — sandstone and sand," says Willis.

Seepage pits contain 1.5-inch septic rock with a 4- or 6-inch perforated PVC pipe in the center to disperse effluent. "We dig a keyway around the outside of the pit, then pour the concrete cap," says Willis. The cap prevents dirt from infiltrating the rock. Pits should last a minimum of 20 years.

Most inland systems have septic tanks with a



Bob Willis uses a Topcon rotary laser to confirm leachfield depth in a new residential septic system as a San Diego County Environmental Health inspector looks on.

12-inch fall to the first leach line. Willis uses 24-inch chambers (Infiltrator Water Technologies) with dams and siphons connecting the trenches, each on a contour and slightly lower than the previous trench. (Distribution boxes were discontinued in 1972 because the tops collapsed as soil shifted on hillsides or slopes.)

Dams and siphons require competent trench sidewalls.

After two-member crews mount a tee with 90-degree elbow to one end of each 4-inch perforated SDR pipe, they point the elbow down grade to the next line. Using a trench shovel, the workers dig a trench in the sidewalls for the cross connection to the next leach line. They leave a foot of competent soil while pouring concrete around the connecting pipe to prevent water from using the trench as a conduit.

SOIL CHALLENGES

Climate causes the second most common repair — replacing septic tanks. Installers switched from concrete to plastic or polyethylene tanks as they entered the market, but the state's wet-dry cycles cause some troubles.

"Our inspections seem to uncover at least one collapsed tank every week," says Willis. "Soil saturated by winter rains first exerts pressure on the tanks. In summer, the ground bakes and shrinks, allowing soil to trickle in around the tanks. Then the cycle repeats, compressing round spaces to oblong until we can't remove the riser lids. At that stage, the tanks are collapsing or have collapsed."

When concrete tanks aren't a replacement option, crews use MultiTanks from Roth Global Plastics, a Roth Industries Co. The blow-molded tanks have an FDA-approved virgin high-density polyethylene layer covered with two layers of polyethylene for stability and one layer of black, UV-stabilized polyethylene.

In 2011, Willis had a repair involving groundwater 18 inches below grade. The only solution was an aerobic treatment unit. He chose a system from Jet Inc. and has remained brand loyal. "The units are simplicity itself and produce high-quality effluent averaging 9 mg/L CBOD5 and 8 mg/L TSS," he says. Jet installations involve effluent flowing to a precast tank, then on-demand alternating pumps dose 1/2-inch driplines (Geoflow) trenched into 6 inches of soil.

STRATEGIC RELATIONSHIPS

Saddled with still more work, Willis hired 19-year-old Dominic Garcia in 2013. Within two years, Willis promoted him to installation foreman and managing repairs. "Dominic's ability to absorb and understand everything he sees is phenomenal," says Willis.

In 2015, Willis entered into a long-term leasing agreement with Lane and Kevin Post of Arrow Pipeline and Pacific Drain for the name and phone number of R.F. McKenna Construction. McKenna's owner, Bruce Cornell, specialized in boring vertical seepage pits, and referred drainfield work to Willis. When Cornell's health failed, his wife referred work to Bob's Septic Service and Arrow Pipeline and Pacific Drain. The owners' teamwork evolved into the strategic relationship.

To invigorate the former construction company, they renamed it McKenna Septic and Sewer and added a pumping service. Willis bought a Model 338 Hino vacuum truck with a 2,400-gallon steel tank, National Vacuum Equipment pump and 3,500 psi/5 gpm jetter from House of

"These pits have much higher dispersal rates and represent the quality of work for which we strive."

Bob Willis

Imports. “We put McKenna’s name on the tank because of its huge recognition factor and the company is our flagship,” he says.

Willis does the septic work and Durham dispatches calls. Arrow Pipeline and Pacific Drain specialize in plumbing, drain cleaning, jetting, sewer connections and waterlines. Pumpouts are booked under McKenna. “Jeff McCabe came over from McKenna to work for me, and I hired Dave Page to run the Hino and perform inspections,” says Willis. “Salvador still lays pipe, but now he also rebuilds corroded concrete septic tanks with Lane McIver.”

Rebuilding tanks involves exposing the top and sides by hand digging down to the waterline. “Because the surrounding soil becomes the concrete form, these digs are very delicate,” says Willis. Then the team overlays the structure with rebar, sets a black corrugated pipe as a riser, pours 4 inches of concrete, and seals the pipe with a Tuf-Tite lid. Once the concrete hardens, they backfill with Willis’ Caterpillar 257 tracked skid-loader.

The leasing agreement enabled Willis to strengthen his relationship with Evan, Chase and Ryan Grenke of Alliance Diversified Enterprises. “Other subcontracted drillers were only able to bore 60-foot-deep pits, which often didn’t penetrate the sand layer,” says Willis. “The brothers, however, have several rotary D-6 size drilling rigs that penetrate to 80 feet. These pits have much higher dispersal rates and represent the quality of work for which we strive.”

ON THE GROW

In 2015, the office phones rarely stopped ringing. Workers installed 24 seepage pits, three ATUs and eight new systems. They also repaired 24 systems and fixed 165 septic problems. Willis hired Todd Durham to manage the pumping division, while technician Dave Page saw 60 to 70 pumpouts per month snowball into working 20 hours overtime some weeks. The 64-mile round-trip to the San Diego Wastewater Treatment Plant was partly responsible.

Every six months, Willis realized he needed another employee — he now has 10 — or piece of equipment. At the 2016 WWETT Show, he ordered a Peterbilt 348 dual-axle truck with 3,600-gallon steel tank and NVE pump built by Lely Tank & Waste Solutions and took delivery in May.

“We’ll probably do almost 200 jobs this year, mainly repairs, and that’s where we need the new truck,” says Willis. “Fortunately, I have a great bunch of guys. Dominic, his helper Brad Groff and Lane are go-getters in their early 20s. I’m hoping to put more responsibility on them in a few years and take some days off each week. The future looks bright. The man upstairs has blessed me.” ■



Willis confirms the depth of a vertical seepage pit bored by another contractor.

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Gearing Up For Greater Productivity

Driver shortages, lower fleet costs push a continued trend toward user-friendly automatic transmissions in work trucks

By Ed Wodalski

The shift to automatic transmissions in vocational trucks continues to gain momentum with strong growth in automated mechanical transmissions and telematics (remote communication of your vehicle's performance).

"If you look at the Class 8 market in particular, we've seen about a threefold increase in the percentage of AMT transmissions purchased over the last six years," says Scott Davis, director — strategic partnerships and customer experience at Eaton. "Roughly half of the Class 8 trucks purchased today have an automated transmission in some fashion."

For those not ready to make the switch from a manual to a fully automatic transmission, the AMT combines a traditional clutch-actuated manual gearbox with a computer-controlled shift actuator and clutch. The best shift patterns are selected electronically for optimal power or fuel efficiency. With computer-controlled shifting and clutch engagement, only two pedals are needed to operate the truck: brake and accelerator.

Driving demand for AMT and fully automatic transmissions is the pursuit of better fuel economy and lower fleet cost, as well as driver shortage, driver retention and the ability to recruit drivers into the industry with less experience. Another contributing factor is a decrease in cost between manual and AMT transmissions.

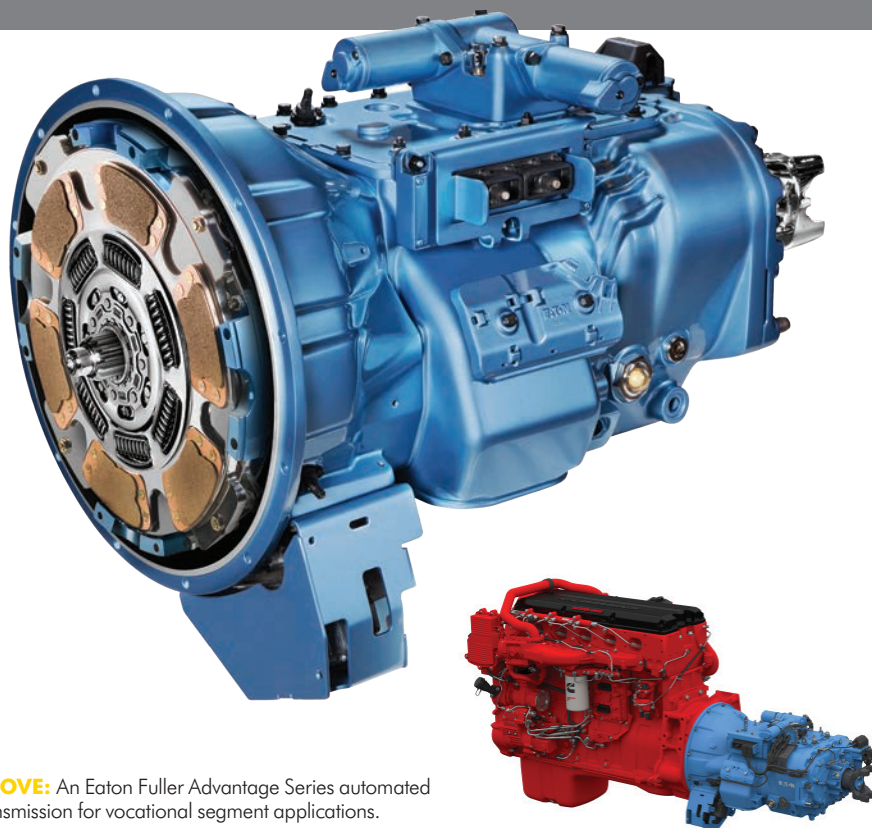
"Resale is a big factor in that equation," Davis says. "The vocational customers are very sophisticated in their financial modeling and figuring out that total life cycle cost, from the initial acquisition to operational costs, repairs and resale. With new technology, whether it's AMT or engines, resale has a big impact."

Technology, specifically telematics and the connected vehicle, are the current hot topic, from engine controllers and transmission controllers to body controllers and ADF controllers.

GREATER EFFICIENCY

"You're seeing trends with the subsystems working closer together to become more efficient," Davis says. "That's a big part of our Smart Advantage powertrain with Cummins — more integration on the control side to get a more fuel-efficient package."

Smaller and lighter transmissions achieved through aluminum enclosures



ABOVE: An Eaton Fuller Advantage Series automated transmission for vocational segment applications.

RIGHT: The SmartAdvantage powertrain pairs an Eaton Fuller Advantage automated transmission with the Cummins ISX15 engine. (Photos courtesy Eaton)

and optimization also contribute to better fuel efficiency as well as greater cargo capacity.

"If you look at one of our flagship products, our Smart Advantage powertrain, one of the purposeful things we did is weight reduction," Davis says. "We looked at it not just as a transmission but as a total system. We were able to eliminate the cooler, the cooling lines and a large amount of oil in that system."

The powertrain optimizes shifting based on grade, vehicle weight, engine torque and throttle position, making every driver as efficient as possible. Since its introduction in 2013, the powertrain has increased fuel economy by about 7 percent, according to Eaton's website.

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"A high percentage of the clutches we sell today are Solo self-adjust clutches. Historically, clutches have required adjustment at a certain interval. The self-adjust clutch helps reduce the amount of preventive maintenance required."

Scott Davis

In addition to less weight, fewer components also means there's less chance for hose and fitting failure.

EMERGING TECHNOLOGY

"If you look outside the vehicle, that's where telematics comes in," Davis says. "Fleet managers have greater insight into what's happening in terms of usage, average speed, duty cycles, as well as indications of potential failures and how to service as a planned repair without extensive unplanned downtime. That's where I think there's a lot of interest from the end customer and more product offerings."

One of the benefits of the emerging technology is the ability of truck owners and fleet managers to fix small problems before they become big problems.

ONBOARD DIAGNOSTICS

"The last thing you want is a truck on the side of the road," Davis says. "The other opportunity it presents is if you have better visibility into the usage of a product, you can extend maintenance intervals by actual usage rather than application."

Emerging technology enables engines to communicate with transmissions, drivetrains and other components, as well as fleet managers.

Linking communication are sophisticated electronics, such as the SAE J1939 controller area network that operates like an onboard intranet. Raw data is collected and broadcast through a cellular connection to a telematics provider, such as Omnitracs, PeopleNet or Geotab, and relayed to the fleet manager.

LESS MAINTENANCE

"I think the real key is going from raw data on the J1939 CAN link into something that is meaningful and actionable," Davis says. "That's where manufacturers like Eaton come into play — how do you avoid hundreds of text or email updates to a fleet manager as opposed to information the fleet manager can use and act on — adjusting maintenance cycles, feedback to drivers or if there is a truck-down situation?"

Technology has also impacted transmission maintenance, primarily extending service intervals for lubricants, and clutches that can go 50,000 miles between greasing.

"If you're a fleet manager, the fewer times you have to grease the clutch the better," Davis says. "A high percentage of the clutches we sell today are Solo self-adjust clutches. Historically, clutches have required adjustment at a certain interval. The self-adjust clutch helps reduce the amount of preventive maintenance required."

So what's the next big thing in truck transmissions?

Concepts already being studied are autonomous vehicle tuning and communication from one transmission to another in local area networks, enabling fleets to travel in tightly packed convoys.

"I think that's the next frontier beyond telematics," Davis says. □

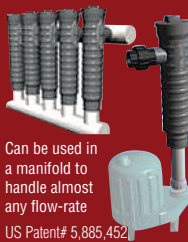
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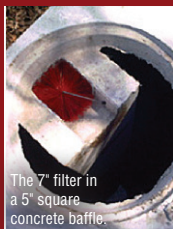


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Alaska Explores New Technologies to Meet Rural Water and Wastewater Challenges

By Doug Day

The Alaska Department of Environmental Conservation (DEC) Village Safe Water Program will hold an invitation-only conference in September to discuss the issue of providing running water and sewer services to remote Arctic and sub-Arctic communities and how to make those services more reliable, affordable and sustainable. The Conference on Water Innovations for Healthy Arctic Homes (WIHAH) will be held in Anchorage Sept. 18-21. Experts from around the world will speak or demonstrate innovative technologies. Three teams in the Alaska Water and Sewer Challenge will showcase their prototype systems in the research and development program seeking alternative and more affordable methods for delivering drinking water and sewage disposal services to rural Alaska. More than 3,300 rural homes lack running water and a flush toilet.

MINNESOTA

The Minnesota Pollution Control Agency is working on a rule change that could require septic tanks to be pumped dry prior to an inspection to determine their integrity. MPCA hopes to have the rule finalized in time for 2017 fieldwork. In working with stakeholder groups, the agency says there is widespread support for the rule since most onsite professionals are already pumping tanks dry for inspections. Some have said, however, it is not always necessary, such as if there is a tank integrity report that shows the tank passed inspection within the last three years.

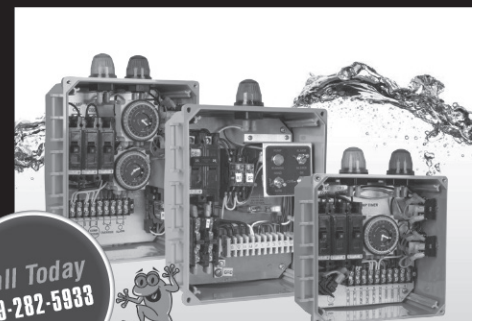
VIRGINIA

Drinking Water and Wastewater Professionals Appreciation Day was held throughout the state June 30. Both houses of the Virginia General Assembly unanimously passed their versions of the bill (HJ 88) earlier this year to recognize the importance of clean water and the contributions of those who work in the field. □

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Finding Environmental Solutions For Installers in Western Canada

One umbrella association is making regulatory headway in serving the training and professionalism needs of diverse groups of wastewater professionals

By Doug Day

From her main office in Edmonton, Alberta, Lesley Desjardins keeps busy working with the onsite wastewater professionals and regulators covering nearly half of Canada. From the Pacific Ocean, across mountains and a desert to Hudson Bay, it is her job to coordinate how those in the industry protect public health and the environment. Members include all areas of the industry, from designers and installers to pumpers, regulators and suppliers.

Desjardins is the executive director of the Western Canada Onsite Wastewater Management Association (WCOWMA). The group covers the provinces of Alberta, British Columbia, Saskatchewan and Manitoba.

How much of your effort involves trying to standardize across the provinces?

Desjardins: That's really important in Canada and one of the reasons we formed WCOWMA, to standardize training across western Canada and allow the western provinces to share training and infrastructure resources.

We have federal and provincial agreements on recognition of equivalent training, such as the Agreement on Internal Trade (an intergovernmental agreement covering all agencies of provincial and federal governments). Somebody certified in onsite wastewater from one province that requires it can go to any other province that requires it and have their certification recognized. So it's really critical that training is standardized, because contractors can come from different regulatory frameworks with differing training requirements. Standardizing training requirements will help mitigate potential issues.

How did this all come together?

Desjardins: We started with the Alberta Onsite Wastewater Management Association (AOWMA), the largest organization in western Canada, which incorporated in 1998. By the mid-2000s, the Alberta association had so many members from British Columbia and Saskatchewan that we decided to create an umbrella organization. Servicing them all from Alberta just wasn't getting our members in other provinces the best representation, so we incorporated WCOWMA federally in 2008 and set up a chapter in each province with its own autonomous board of directors. Each is financially independent from the others.

WCOWMA allows the provinces to share information and resources such as curriculum and infrastructure like a shared website and phone system,

Lesley Desjardins
877/489-7471 or email Lesley@wcowma.com
WCOWMA



while giving us the ability to combine the voices from all the provinces for advocacy purposes. There is staff in each province and I manage all four chapters. We have four contracted staff, one who deals with Saskatchewan and Manitoba, one for British Columbia, and two in Alberta. We're pretty busy.

Each of the boards meets every six to eight weeks and I attend either in person or virtually, which makes my life a little easier. As each provincial association becomes larger, they will require their own operations manager. We're not there yet.

What are the membership numbers?

Desjardins: We have two membership classes. There are voting corporate members (companies), and nonvoting under-corporate members (employees of member companies). Alberta, Saskatchewan and British Columbia are all growing, and right now B.C. is enjoying about a 20 percent growth rate in membership per year. Alberta has 568 corporate, 320 under-corporate members; British Columbia has 204 and 105; Saskatchewan has 60 and 25.

Manitoba is a little different. We don't actively recruit memberships and collect member dues because they have an onsite group, the Onsite Wastewater Systems Installers of Manitoba, and we don't want to hinder their ability to attract members. We focus on advocacy with the government and the promotion of homeowner education there. We have provided support to them over the years such as training and workshops.

How do you interact with regulators across the provinces?

Desjardins: I regularly meet with them either in person or in virtual meetings and I sit on a variety of committees in the provinces. Probably every six weeks or so I'm traveling from one group to another. During the convention season in January through April, there's a significant amount of intra-provincial work that may require travel throughout Canada and sometimes the United States.

British Columbia has been particularly busy in the last year because we have submitted training curriculum to their certification body for accreditation. Over the last year-and-a-half, some of the training has been adapted from other provincial training programs, some has been developed in B.C., and some was adapted through our partnership with NAWT (National Association of Wastewater Technicians). We partnered with them on some of their O & M and inspection training. B.C. also adopted a new Standard Practice Manual in 2015, so there has been a learning curve related to that.

In Alberta, the Safety Codes Council adopted a new Standard of Practice that became effective in January. The transition to that will go on for the next year. All certified contractors in Alberta are required to participate in continuing education. The AOWMA is currently delivering that training throughout the province. More than 1,300 contractors will be trained during 2016 and early 2017.

"Whenever there's a recession, there's a lot more competition. That's when you typically see things like underbidding jobs, which are not positive. It can lead to inadequate systems being installed."

Lesley Desjardins

Saskatchewan's Ministry of Health has always worked closely with Alberta and adopted its training program in 2009 so the guidelines are very similar. Training isn't mandatory there, but the industry is very keen to see that. The regional health officers who do the system inspections are pushing for it as well. There is some hesitancy at the ministry level. The population is only about 1 million people and the onsite industry is quite small. But about 150 contractors and health officers have voluntarily participated in certification training; that's a significant number.

Manitoba has had no one at the ministry level for onsite wastewater for about three years. Last year, Manitoba Conservation hired a new manager in that capacity. He has a background in onsite wastewater, worked as an inspector, and did research in this industry so he brings a lot of expertise to the position. Currently, we are in the process of sharing curriculum and resources as Manitoba Conservation plans for a training program update, making some changes to their continuing education requirement, and expanding access to field workshops. Certification is required in Manitoba, but they haven't had their own standard of practice, and that looks like something they want to change. It will be interesting to watch and hopefully participate in that process.

How does representing such a broad territory complicate things?

Desjardins: You do see different types of systems from province to province largely due to geographical differences. The coastal areas of British Columbia are very much like Washington state; there are mountains in the east and west, but the interior has the Okanagan Desert and high prairie in the north. Alberta and Saskatchewan have very similar high prairie and forest landscapes, except Alberta has the Rocky Mountains. Manitoba and Saskatchewan have issues with heavy clays and a lot of lakes. There are certainly regional challenges with the types of systems that can be used.

Overall, the challenges and issues experienced in the industry are very similar from province to province.

What challenges are coming up for the onsite industry in western Canada?

Desjardins: We weren't really impacted by the recession of 2008-09, but we are being impacted now. In Alberta, Saskatchewan and part of northern

British Columbia, the oil industry is really depressed. So we're going to be seeing people who work in private sewage in the oil industry, which is a different animal altogether, moving to work in the residential sewage industry. That may create some issues because the design and installation of these types of systems is significantly different.


Whenever there's a recession, there's a lot more competition. That's when you typically see things like underbidding jobs, which are not positive. It can lead to inadequate systems being installed. We're anticipating that we may see some fallout from the fact that the western provinces are feeling the pinch of a recession right now. □

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Taking the Small Lot Retrofit Challenge

A system using combined treatment and dispersal tubes provides a solution for a cottage on a small lakeside lot

By **Scottie Dayton**

Owners of a two-bedroom seasonal lakefront cottage in Maidstone, Vermont, realized their functioning cesspool was leaching untreated wastewater into Maidstone Lake. They searched online for a contractor to replace it and found Mike Carbonneau, owner of Connecticut Valley

Design in Littleton, New Hampshire.

“Today’s standards would never allow the lot to be developed,” says Carbonneau. “A drainage ditch was 10 feet from the dry well, which was less than the mandated 25 feet from the ditch.”

In addition, the Vermont Shoreland and Wetland Protection acts had become effective, and both had their own requirements. For grandfathered systems, the agencies allowed designers to submit a “best fix” that located replacement components where they met as many regulatory criteria as possible.

“With so little room to work, the Advanced Enviro-Septic system from Presby Environmental became my linchpin,” says Carbonneau. “It provides secondary treatment without the expense of an advanced treatment unit, and rates a 50 percent reduction in basal area over pipe-and-stone drainfields.”

Despite the ease with which the treatment dispersal tubes assembled, short daylight hours, inclement weather, high groundwater, and 80-mile round-trips to the quarry slowed progress and stressed the team.

SYSTEM PROFILE

Location:	Maidstone, Vermont
Facility served:	Two-bedroom lakefront cottage
Designer/Installer:	Mike Carbonneau, Connecticut Valley Design, Littleton, New Hampshire
Site conditions:	Gravelly fine sandy loam with friable granular structure
Type of system:	Passive combination treatment dispersal system
Hydraulic capacity:	420 gpd



<<OPPOSITE PAGE: Justin Marvin prepares to check the level on the bottom half of the 2,000-gallon combination concrete tank, while Vinny Lepine from Calco releases the tension on it.

>>RIGHT: Two Wacker Neuson 3-inch dewatering pumps run continuously as Justin Marvin backfills by hand around the 4-inch PVC lateral. (Photos courtesy of Mike Carbonneau)

SITE CONDITIONS

Soils are gravelly fine sandy loam with friable granular structure, a percolation rate of 12 minutes per inch, and a seasonal high water table of 15 inches. Maidstone Lake defines the west boundary of the 0.23-acre lot.

SYSTEM COMPONENTS

Carbonneau designed the system to handle 420 gpd. Major components are:

- 2,000-gallon combination concrete tank (Calco)
- STF-110 effluent filter (Sim/Tech Filter)
- Champion 1/3 hp high-head effluent pump
- 180 feet of AES treatment dispersal pipes, vented (Presby Environmental)
- 30 tons of ASTM C-33 washed concrete sand with no more than 2 percent fines passing a No. 200 sieve
- 112 tons mound sand
- Control panel with alarm (Sim/Tech Filter)

SYSTEM OPERATION

Wastewater flows by gravity from the cottage through a 4-inch Schedule 40 PVC pipe to the 1,250-gallon septic chamber 8 feet away. Effluent passes through the filter, then enters the 600-gallon dose tank. The on-demand pump cycles two minutes, sending 54 gpm 33 feet through a 2-inch PVC Schedule 40 force main to the distribution box.



A 4-inch PVC gravity supply line from the distribution box doses six 30-foot-long laterals. Each 12-inch O.D. AES tube has a 10-inch I.D. corrugated, perforated plastic pipe where treatment begins. Ridges on the pipes increase surface area and circulate effluent uninterrupted, cooling it to ground temperature. Skimmers at each perforation help retain grease and suspended solids, protecting the three outer textile layers from clogging.

The white Bio-Accelerator layer develops the biomat, screens more solids, and evenly distributes effluent along the length of the laterals. A mat of coarse green plastic fibers traps more solids and creates a massive suspended growth area for aerobic bacteria. Black geotextile fabric protects the inner layers and provides more surface area for nutrient uptake. As the sand bed wicks liquid from the fabric, it transfers air to the microorganisms. Third-party testing proved the system treats effluent to less than 2 mg/L TSS and CBOD and to 218 CFU/100 mL fecal coliform.

INSTALLATION

Parking the Hyundai Robex 140 LCD-7 excavator just off the narrow main road enabled Justin Marvin to excavate to basal grade for the drainfield. Every scoop he loaded into the Mack 10-wheel dump truck required swinging the boom under the main electric power line overhead. The cautious work helped stretch the day to 14 hours, much of it plagued by rain, snow and cold temperatures.

Carbonneau needed a 50-foot-long temporary drive across the drainfield and lawn to reach the combination tank's excavation site and cesspool beside the house. He planned to protect the field's receiving soil with 12 inches of concrete sand overlaid with 24 inches of crushed stone to sustain the weight of heavy vehicles.

Then Marvin unearthed a boulder the size of a Volkswagen. "It had to be 6 by 6 by 7 feet wide," says Carbonneau. "Lifting it was not an option." Marvin won the lengthy battle to roll the monster with the bucket to the edge of the lot.

With the drive-in service, Schofield's Septic Tank Service pumped the cesspool. As Carbonneau backfilled it with bank run sand, Marvin





<< LEFT: A homeowner observes as the laterals are backfilled with 12 inches of concrete sand.

BELOW: Justin Marvin pushes concrete sand off the road and onto the 12-inch-deep absorption bed.

"I used to set individual septic tanks and pump tanks, but the 6 feet of compacted fill between them often settled enough to break the pipe connection. Investing in two-compartment tanks eliminated excavating and repairing my mistake."

Mike Carbonneau

excavated the hole for the 12- by 6- by 6.5-foot tank. Such excavations normally displace 12 to 14 cubic yards of material, but the wet sidewalls sloughed continually.

Marvin sloped the excavation until he had a 20- by 20- by 7-foot hole with one side 12 inches from the cottage. Carbonneau hauled 80 cubic yards of spoil offsite in nine loads with the Mack truck. Meanwhile, Marvin bedded the hole with 6 inches of compacted crushed stone. Two Wacker Neuson 3-inch dewatering pumps exhausting to sediment filter bags barely kept up with incoming groundwater.

Vinny Lepine of Calco delivered the tank sections at 1 p.m. Besides joining the halves with mastic sealant, the top of the pump chamber dividing wall was sealed to stop effluent from infiltrating and affecting dose cycles. Mastic was also applied around the risers to reinforce the gaskets and prevent infiltration through the lid.

"I used to set individual septic tanks and pump tanks, but the 6 feet of compacted fill between them often settled enough to break the pipe connection," says Carbonneau. "Investing in two-compartment tanks eliminated excavating and repairing my mistake."

To prevent pressure-induced infiltration, Carbonneau prepared to apply an 8-inch-wide butyl rubber wrap around the exterior tank joint. After Marvin suspended a sheet of plywood overhead to keep out snow, Carbonneau dried and heated the concrete using a 100,000 Btu blowtorch with 2-inch head connected to a common propane tank. "As long as everything is warm, the spray adhesive bonds the wrap to the surface in seconds," he says. It did.



High groundwater also made the tank buoyant. To counteract it, Marvin set two 2- by 2- by 4-foot concrete anchors on both sides of the tank. After placing stainless steel cables over the lid, they fastened the cables to stainless steel rings in the ballast, tightened the cables and backfilled with 80 tons of mound sand. It took 14 hours to excavate and install the tank instead of the usual two to three hours.

The system depends on passive air movement to support aerobic bacteria, but the pump, acting like a gate valve, interrupts the flow. To restore it, Carbonneau installed a 4-inch PVC bypass vent from the dose tank to the distribution box.

"We use convection to draw air from the 4-inch screened low-vent PVC pipe in the drainfield, through the system, and out the roof vent on the house," he says. "The bypass continues the vent path. It also mitigates hydrogen sulfide corrosion by allowing heavy gases to escape."

Marvin excavated the 4-foot-deep trench for the force main and bypass line. As groundwater poured in, Carbonneau started the dewatering pumps. "The solvent needs a dry environment to weld the sticks of pipe properly," he says.

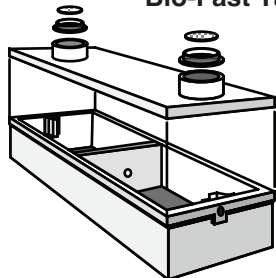
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Commercial Sizes - Gallons

2,000 - 3,000 - 5,000 - 6,000 - 8,000
10,000 - 12,000 - 15,000 - 18,000
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Good weather returned for the drainfield's installation. Marvin removed the gravel from the temporary drive, then built up 12 inches of concrete sand (80 tons) to create the 32- by 12.5-foot absorption bed. Carbonneau used a DEWALT laser to ensure the bed was level. "A flat surface is critical to achieving a uniform flow down the length of the laterals," he says.

Assembling the 10-foot-long pipes went quickly. Corrugations on them matched those on 8-inch-wide couplings that locked around the pipes like zip ties. Marvin backfilled the laterals on 18-inch centers with 12 inches of concrete sand, then covered them with 6 more inches (30 tons total) overlaid with 3 inches of loam. Carbonneau seeded the field in spring.

MAINTENANCE

The tank, effluent filter and pump require inspection every two years. Cleaning is necessary when the combined thickness of sludge and scum equals more than one-quarter of the tank's liquid depth.



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Ecoflo PACK From Premier Tech Aqua is Designed For a Compact Footprint

By Craig Mandli

We live in a society where the phrase “doing more with less” has become a mantra. It’s no different for onsite installers, as the need for systems that can treat large flows while fitting into exceedingly smaller footprints continues to grow. The Ecoflo PACK, a compact treatment system introduced by Premier Tech Aqua at the 2016 Water & Wastewater Equipment, Treatment & Transport Show, is such a product.

“The issues we are seeing typically involve people buying and deciding to build large family homes on small parcels, or buying a small cabin and deciding to expand it into a full-size family home,” says Robert Flantua, wastewater treatment services coordinator with Premier Tech Aqua. “Many of these are also waterfront properties, often with increased treatment regulations.”

With a single monobloc unit integrating a primary tank and a biofilter, the Ecoflo PACK is designed to be suitable for either primary or secondary homes with up to a 600 gpd capacity, typically four or more bedrooms. The NSF-certified system is based on Premier Tech Aqua’s compact filter technology that treats wastewater without energy while retaining pollutants, thanks to 100 percent organic filtering media. The treated wastewater is then released to infiltrate the natural soil for final purification and protection of groundwater sources.

“The coconut husk fiber is really the key to the effectiveness of the system,” says Flantua. “It enables us to create a system where you can get a large hydraulic load in a small footprint.”

The system is designed to clarify wastewater coming from the residence by retaining solids. The system offers ease of maintenance and all the benefits of a recyclable filtering media that can be accessed via the lid at the end of its useful life. The used filter material, which carries a 10-year life cycle warranty, can then be composted or amended into soil to break down naturally.

“It is a completely passive system of treatment, and even works during power outages,” says Flantua. “That leads to a nice energy savings long term.”

Systems are available in ready-to-use rotomolded polyethylene shells or as a kit to be integrated into concrete tanks, reducing transport logistics and wait time. A nitrogen-removal option is also available. Premier Tech Aqua featured the Ecoflo PACK at the inaugural WWETT Show Kickoff Party inside




A large group of attendees surround Premier Tech Aqua’s Ecoflo PACK unit at the 2016 WWETT Show Kickoff Party inside Lucas Oil Stadium. The compact passive wastewater treatment unit uses a coconut husk filtering material to treat wastewater from homes with flows of up to 600 gpd. (Photo courtesy of Premier Tech Aqua)

Lucas Oil Stadium, and getting the unit in front of thousands of attendees was exciting, according to Flantua.

“We are very happy that we chose to bring the PACK to the Kickoff Party and focus on it,” he says. “It created a lot of buzz right from the beginning. I think having the actual product on the floor helped us make several sales.”

Feedback about the unit was positive as well. Flantua says that many WWETT Show attendees were excited to see a small unit that offered large flow treatment. Others were interested in learning if the technology could be adapted to smaller-scale homes of three or fewer bedrooms.

“We’re actually looking at bringing a PACK unit designed for smaller homes to the 2017 show,” says Flantua. “There’s certainly a need for those as well, and it’s something we can fill.” 800/632-6356; www.premiertechaqua.com. 



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The WWETT Show - Water & Wastewater Equipment, Treatment & Transport - is the world's largest annual trade show for environmental service professionals. Over 10,000 attendees will gather from across the U.S. and beyond to see the latest in equipment and technology in the expo hall, participate in over 100 education sessions, and network with professional colleagues.

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Building a Tiny House? Where Does the Waste Go?

Cute little homes on wheels are all the rage today, but while the DIY TV shows talk about low cost and mobility, they seldom hint at how wastewater is handled by the homeowners

By Jim Anderson and David Gustafson

Recently, Jim's daughter and son-in-law were looking for a house to purchase to start their new life together. As they went through the process, they watched all the programs about house hunting on the cable TV channels. This is something Jim and his wife would probably never watch on their own, but they took a look so they could contribute to the conversation.

One of the programs was about the latest lifestyle rage — tiny houses. These are homes of 500 square feet or less, often as small as 200 square feet. It is amazing how a builder can pack all the modern conveniences into such a small space! In one of the episodes, the homebuyer indicated they had a hard time persuading the local county planning and zoning department to let him put the house on a secluded vacant lot. No further explanation was given, but it prompted Jim's daughter to ask: What about the septic system?

Exploring the topic a little further reveals there are a number of issues with how these small houses do or do not fit into local zoning requirements, such as minimum sizes for permanent residences, the

need for foundations, etc. These were probably the items of most concern to the buyer on the cable show. Most state codes and local septic ordinances are tied to numbers of bedrooms or numbers of water-using devices to estimate daily sewage flows, which are used to determine the size of the septic tank and the size of the soil treatment area.

We would be interested to hear if tiny house onsite systems have been an issue for you or have been addressed in your area. If so, what was the outcome and were the new owners of these trendy little houses satisfied?

CHECK GUIDELINES

Another complicating factor is that many of the tiny houses shown utilize composting toilets. We're

sure this is challenging to local administrators and county boards to determine how to deal with these requests, and to you as an installer to determine what to tell the person requesting you to design and install a system for them.



This example of a tiny house was on display at the Midwest Renewable Energy Fair in Wisconsin. These homes are gaining in popularity, but builders need to consider the appropriate onsite system for them. (Photo by Jim Kneiszel)

Typically, your local government has guidelines to help determine some of the requirements for any onsite system. Minnesota and Wisconsin have many thousands of seasonal dwellings on lakeshores or hunting properties. So local units of government have had to deal with unusual situations on a regular basis.

To that end, we looked back at how we dealt with flows for these situations with a septic advisory committee. The tiny houses seen on cable TV would fit under one of two categories when estimating sewage flows for design purposes: For a small house with a regular flushing toilet and two other water-using devices such as a dishwasher, clothes washer, shower, etc., the lowest estimated daily flow would be 180 gallons. If a composting toilet was used, the estimated daily flow for what is then a graywater system would be 60 percent of that value or 108 gallons per day.



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SIZE THE TANK

Septic tank size would be determined by the minimums necessary. So in the first case, the size would require a 1,000-gallon tank. For the second example, a 750-gallon tank would be required. Many local ordinances require higher minimums based on the likelihood that those “seasonal” residences would become fully occupied. In the case of the tiny houses seen on TV, the owners anticipated this would be their residence. By that standard, the minimums would then become 1,000 gallons for both systems. We would opt for a 1,500-gallon tank in anticipation the situation will likely change in the future, but that is just our designer background coming into play.

Sizing and location of the soil treatment area would be done the same as for a typical system. All setbacks — horizontal and vertical — would remain the same. The soil-sizing factor would be determined through soil analysis. You may encounter some minimum trench or soil area requirements. Once again, our designer background would say a little bigger may be better.

If the system is considered graywater-only, it needs to be clear that no toilet wastes are allowed. A number of areas do not allow the use of composting toilets because of previous bad experiences due to odors or vectors (insects). As always, as an installer it is important to know these requirements and be prepared to answer the owners’ questions.

If your local zoning administration has not dealt with the issue of tiny houses, these suggestions can be a starting point for discussion to determine system requirements. We would be interested to hear if tiny house onsite systems have been an issue for you or have been addressed in your area. If so, what was the outcome and were the new owners of these trendy little houses satisfied? ☐



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Distribution Equipment and Systems

By Craig Mandli

DISTRIBUTION BOXES

Clarus Environmental Tru-Flow Splitter

The Tru-Flow Splitter distribution box from Clarus Environmental can accurately split wastewater effluent flows that range from 1/10 to 30 gpm into two to five distribution lines. It is constructed of lightweight, noncorrodible materials, making it easy to install and long lasting. It consists of a diverter basin and cover and a diverter. The bubble level design allows for simple post-construction adjustments, solving the problems associated with distribution box settling. The unit may settle as much as 15 degrees to the front or back and/or 12 degrees to one side and, when adjusted, will still evenly split effluent. With a 4- or 6-inch riser to the surface, the unit is easy to inspect, adjust and maintain. 800/928-7867; www.clarusenvironmental.com.



Polylok distribution box

Distribution boxes from Polylok allow installers to choose the height of inlets and outlets. They come with a seal that accepts 2-, 3-, 4-inch and corrugated pipe (the 20-inch unit accepts 6-inch pipe). The 12-inch unit comes with stabilizing feet to anchor the box. 877/765-9565; www.polylok.com.



Tuf-Tite distribution box

Strong, stable, permanent, noncorrosive distribution boxes from Tuf-Tite come with a Speed Leveler in each outlet. They are available in four sizes: four-, six-, seven- and nine-hole. Risers are available for the four- and seven-hole units. All boxes come with a one-piece watertight seal that accepts 1.5-, 2- to 3-, and 4-inch SDR35 or Schedule 40 pipe, corrugated for ease of installation. 800/382-7009; www.tuf-tite.com.



DRAINFIELD MEDIA

Anua Puraflo Dn

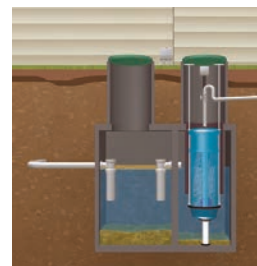
The Puraflo Dn peat fiber biofilter system from Anua provides enhanced denitrification below 20 mg/L through recirculating 50 percent of the treated effluent back to the front end of the septic tank, according to the maker. Flow proportioning is accomplished through



simple adaptations to external plumbing, allowing for a single pump system with no aerators. In recirculation mode, each module is rated for domestic strength at 240 gpd total hydraulic loading equivalent and 120 gpd forward flow. It can be designed and installed as a combined treatment and effluent dispersal system. Treated effluent exits the modules via weep holes around the perimeter at the module base, and flows into the dispersal system situated directly beneath the modules. Available dispersal system options are inground pad or mounded pad. 336/547-9338; www.anuainternational.com.

Bio-Microbics BioSTEP

The pre-screening/pretreatment BioSTEP system from Bio-Microbics filters the solids down to 1/8 inch and transfers the screened liquids under pressure to the wastewater treatment system. The prepackaged system can be used in small-diameter, decentralized collections applications. All systems are available as individual components or preassembled in ready-to-install packages. Filtered pump vaults incorporate a slotted filter screen with swabbing handles and integral ScumGuard to provide a submersible pump with protection from large solids and laden scum, allowing for clean-in-place maintenance and quick servicing. 800/753-3278; www.biomicrobics.com.



Geomatrix Systems GeoMat

The GeoMat leaching system from Geomatrix Systems consists of a core of fused, entangled plastic filaments surrounded by a high-capillary geotextile fabric. When sized accordingly, it is compatible with pretreated wastewater or septic tank effluent. Uses also include subsurface irrigation and evapotranspiration systems. It is 1 inch high and available in 6-, 12- and 39-inch widths. A pressurized distribution pipe typically runs the length of the lateral for uniform application of wastewater. Additionally, it can be configured with a time-dose pump station for flow equalization. The combination of pressure dosing and flow equalization reduces peak hydraulic loading. The thin, narrow profile, shallow burial depth and uniform hydraulic loading maximize efficiency of oxygen transfer. It has complete surface contact with the soil and is not reliant on complex valving and filtration systems. The distal head pressure is fully adjustable through manual zone valves. 888/764-5247; www.geomatrixsystems.com.



Pagoda Vent septic vent

Septic vents from **Pagoda Vent** can help enhance system function with landscape appeal and homeowner approval. The premade units provide the necessary ventilation to the drainfield, and have a durable, lightweight exterior that won't fade or rust. The units encourage a healthy subsurface environment, mitigate harmful gases and preserve concrete component integrity by diminishing the opportunity for microbial-induced corrosion. Optional odor filter cartridges are available and fit concealed in the vent unit. 888/864-1468; www.pagodavent.com.



Presby Environmental EnviroFin

The **EnviroFin** passive onsite wastewater treatment and dispersal system from **Presby Environmental** is designed to have a small footprint and ship easily, while maintaining and exceeding NSF/ANSI Standard 40 treatment. The effluent leaves the septic tank and enters the fin distribution unit, where it settles and breaks down suspended solids. Skimmer tabs located at the perforations prevent grease and suspended solids from leaving the FDU. The FDU distributes the effluent into each of the eight treatment fins, filled with coarse green plastic fibers, filtering and digesting more suspended solids while creating a massive bacteria treatment area. Each treatment fin has a perforated pipe functioning as an air duct across the top, providing oxygen to promote bacterial growth. The unit is buried in C-33 concrete sand and is installed with differential vents for airflow. It ships in a 2- by 4- by 2-foot box weighing less than 65 pounds. 800/473-5298; www.presbyenvironmental.com.



Sim/Tech Filter STF-100A2

The STF-100A2 pressure filter from **Sim/Tech Filter** helps maintain proper and efficient year-round operation of mounds, sand filters and other pressurized distribution systems. The low-head-loss (.21 psi) pressure filter mounts on the discharge side of an effluent pump, acting as a last line of defense to prevent plugged holes and reduce effluent TSS. This mounting location also extends the time between servicing. The vortex action created by the pump scrubs the screen and the backflow through the filter after the pump shuts off, washing debris out. A single 2-inch filter can handle flow rates up to 83.8 gpm. It can be designed to handle almost any flow rate or load. Larger 3- and 4-inch filters are available. The standard screen filters to 1/16-inch and optional socks allow for additional filtration to .024, .007 or .004 inch. 888/999-3290; www.simtechfilter.com.



DRIP TUBING

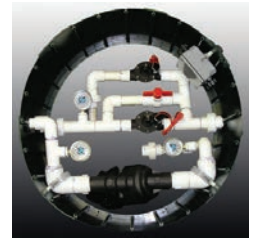
Geoflow Wasteflow

The **Wasteflow** dripline irrigation system from **Geoflow** is placed directly into the soil at the plant's root zone, where effluent is released slowly and uniformly to be digested and absorbed safely. It can be used on difficult sites, including shallow soil profiles, steep slopes, limited setbacks or in areas with poor soils. Molded Rootguard in each emitter is designed to protect against root intrusion, while the Geoshield component protects against biological buildup. 800/828-3388; www.geoflow.com.



Jet Inc. Drip Irrigation Headworks

The **Drip Irrigation Headworks** package from **Jet Inc.** is designed as a direct-mount device on an effluent pump tank to filter effluent while controlling pressure to the dripfield. It is available in auto or manual flush options, and contains a 1.5-inch vortex screen filter and preinstalled pressure gauges to monitor pressure drop across the filter component and regulate pressure to the dripfield. The package mounts onto an existing 24-inch riser for easy access to the pump, float tree, integrated vortex filter and controls. It is available as part of the complete Drip Disposal Field Package that complements the effluent quality produced by the J-1500 Series Bat Media treatment system. An optional flowmeter package and pressure relief valve is available to meet site-specific and regulatory criteria. 800/321-6960; www.jetincorp.com.



Netafim USA Bioline

Netafim USA Bioline is purple polyethylene dripline designed for use in systems ranging from domestic septic strength to secondary-treated effluent or any situation where non-potable water requires even application. Drippers are debris-resistant, continuous self-flushing and pressure compensating. They deliver a precise application rate over a broad pressure range and are molded with an antibacterial that lasts for the lifetime of the dripline to prevent microbial slime buildup. There is no special handling or storage requirements, and no dangerous chemicals are required to protect against root intrusion. It can be used in any type of soil and doesn't require complex equipment to install. It can precisely deliver effluent, making it usable in environmentally sensitive areas, tight soils, slopes and for the beneficial reuse of effluent. 888/638-2346; www.netafimusa.com.



PIPING

Advanced Drainage Systems septic stack

Available in configurations of nine, 11 and 13 pipes, septic stack units from **Advanced Drainage Systems** allow for soil contact without using gravel. Pipe is engineered with holes and slots, allowing it to collect and disperse effluent as it passes over the corrugations in the pipe. Using 4-inch HDPE pipe provides abrasion and corrosion resistance. With lengths of 10 feet, design flexibility is allowed due to fast installation times. The units are lightweight and have a high storage volume with structural strengths that will support H-10 load rating with 12 inches of settled cover. Applications include trench low-pressure piping, pressure distribution, and trench, mound and bed configuration. They are available for use in both residential and commercial applications. 800/821-6710; www.ads-pipe.com.



PUMPS

Ashland Pump EP50

The EP50 effluent pump from **Ashland Pump** has a continuous-duty-rated, energy-efficient 1/2 hp PSC motor with performance reaching 105 gpm and 53 feet of head pressure. It is constructed of heavy-duty cast iron with a cast iron impeller capable of passing 3/4-inch solids. It is available in 115-volt with a wide-angle piggyback switch and also in 230-volt manual versions. 855/281-6830, www.ashlandpump.com.



Environment One Corporation Upgrade

The Upgrade replacement grinder pump from Environment One Corporation has a universal design for drop-in conversion and connection in most grinder pump wet wells. All solids including plastic, rubber, fiber and wood are ground into fine particles, allowing them to pass easily through the pump, check valve and small-diameter pipelines. The grinder is designed not to jam and for minimum wear to the mechanism. It comes with a self-contained level control system, eliminating float switches. 518/346-6161; www.eone.com.



Flygt - a Xylem Brand N-3000

The N-3000 Series solids-handling pump from Flygt - a Xylem Brand has self-cleaning hydraulics, and continuously delivers sustained high efficiency resulting in a minimum of a 25 percent energy savings, according to the maker. The Adaptive N-impeller is designed to move axially upward when needed, providing clog-free performance. It minimizes unscheduled downtime, resulting in further maintenance cost savings. It can be easily retrofitted into existing conventional non-clog pump installations. 855/995-4261; www.xylem.com.



Franklin Electric IGP Series

IGP Series grinder pumps from Franklin Electric can operate on nominal voltages ranging from 208 to 230 volts in one model. Their motor and construction are designed to handle low-pressure sewage applications, using the same cutter system at 414,000 cuts per minute. They incorporate a non-clogging impeller staged for efficient pumping of sewage slurries with a shut-off head of 130 feet. Available in an automatic version for single-phase power sources and a manual version for both single-phase and three-phase power sources, they employ a 2 hp single-phase, 3,450 rpm (with capacitor) start/run motor with built-in overload protection to prevent overcurrent and overtemperature damage. They have corrosion-resistant brass impellers that minimize downtime and maintenance and an epoxy-coated cast iron finish for corrosion resistance and durability. 260/824-2900; www.franklinengineered.com.



Gorman-Rupp Company Eradicator Solids Management System

The Eradicator Solids Management System upgrade kit for Super T Series self-priming centrifugal pumps from Gorman-Rupp Company can handle new sewage, poultry waste, plastic bags, hair, and stringy and other clog-prone materials that may wreak havoc on pumps. The system consists of a lightweight inspection cover, a back cover plate incorporating an obstruction-free flow path, and an aggressive self-cleaning wear plate including laser-cut notches and grooves, along with a tooth designed to clear material from the eye of the impeller. It can be easily installed into existing Super T Series pumps in the field. 419/755-1011; www.grpumps.com.




Septic Services Retro-Air Rejuvenator System

The Retro-Air Rejuvenator System from Septic Services provides a complete drainfield rejuvenation system that returns a failed existing septic system back to optimal flow and performance, according to the maker. It can be used in new or existing septic systems and can be installed in single- or multiple-compartment septic tanks. It helps eliminate clogged drainfield biomat, as well as other secondary treatment systems, and is recommended in aeration systems that are prone to backup. It is quick and easy to install and requires minimal maintenance. It is available in several models. 800/536-5564; www.retro-air.com.



Webtrol Pumps WTE Turbine Effluent Series

WTE Turbine Effluent Series pumps from Webtrol Pumps are constructed from 304 stainless steel as well as corrosion-resistant plastic. The floating stack design provides resistance to abrasive damage, extending the life of the pump. They are available in flow ranges from 5 to 60 gpm, 1/2 to 5 hp, 115- or 230-volt, and single and three phase, offering numerous options for almost any wastewater application. 800/769-7867; www.webtrol.com. 



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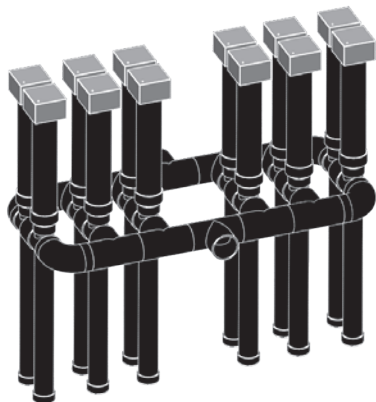


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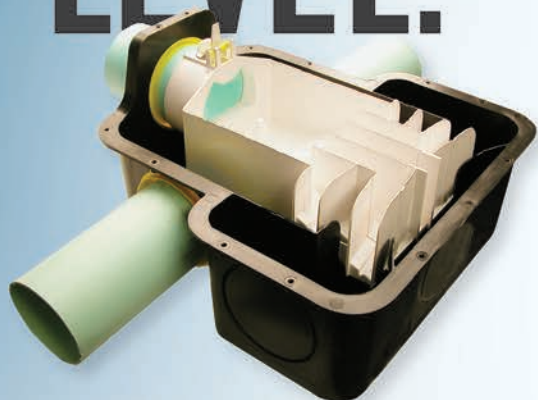


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
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Distribution Equipment and Systems

By Craig Mandli

Sand filter system installed in mountainous mobile home park

Problem: A mobile home park located in the mountains of North Carolina with limited space and poor soils needed to treat its 30,000 gpd of wastewater to the highest level possible. The park also sought energy-efficient equipment with low maintenance requirements.

Solution: The owners chose the E-Z Treat Re-Circulating Synthetic Sand Filter, a system that is NSF-350 water reuse and NSF-245 certified, from E-Z Treat Company. Design engineer Marty Kocot from Landworks Engineering installed the system.

Result: The system works as expected and has needed minimal maintenance to keep in operation. 866/753-4770; www.eztreat.net.



Lightweight dispersal units used on lakeside system

Problem: Homeowners on Sugden Reservoir in Spencer, Massachusetts, were preparing to sell their year-round lakeside residence. As a selling point, they wanted to replace a mature septic system before putting the house on the market. However, the site had multiple constraints, including limited access to the backyard and setback requirements to the lake, which limited space for a new system. Additionally, the aging septic tank needed to be replaced.

Solution: Gobi Land Engineering designed a 330 gpd system for the three-bedroom home using 24 M5.2 units. The plan design used gravity distribution, and allowed the project to obtain a waiver for setback distances. Gary Pike Construction removed the existing system, and then installed three rows of eight of the M5.2 units. Installers were able to fit an excavator in the restricted backyard, complicated by the slope leading down to the reservoir, to dig the bed and lay down 6 inches of ASTM C33 sand. The lightweight units were hand-carried into position before being backfilled with ASTM C33 sand and clean fill. Eljen Corporation provided on-site training, and the drainfield was installed in a matter of hours.

Result: The homeowners were able to get the new, code-compliant system installed quickly, with time to enjoy the summer months on the lake before selling the property. 800/444-1359; www.eljen.com.



System solves limited space and shallow water table challenges

Problem: A failing residential septic system more than 40 years old, limited space, and groundwater at only 4 feet from the surface grade caused a Kansas homeowner to turn to Tim Wagner, water-quality specialist for Sedgwick County, Kansas, for help. The options were limited, and finding a suitable location for the system was further complicated by sandy soils and close proximity to a lake. Previously, the county recommended drip irrigation for such cases, but recent gopher damage to the driplines of those systems prompted a search for alternatives.

Solution: Wagner designed a 450 gpd system including five 45-foot lines of EZflow geosynthetic aggregate from Infiltrator Water Technologies installed on 5-foot centers. The LPP lines are installed 8 inches deep to maintain more than 2 feet of separation from the limiting layer or water table at 4 feet. The system was installed in reverse order to keep traffic off the LPP lines, minimizing compaction. Due to the shallow water table, the tank excavation had to be dewatered to set the tank. Installer Chad Mills of H D Mills & Sons was contracted to complete the installation.

Result: "EZflow was fast and easy to install and enabled us to handle the 450 gpd flow in a very small area," Mills says. 800/221-4436; www.infiltratorwater.com. □





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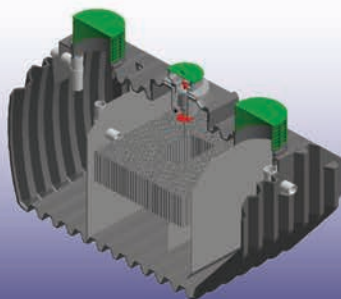
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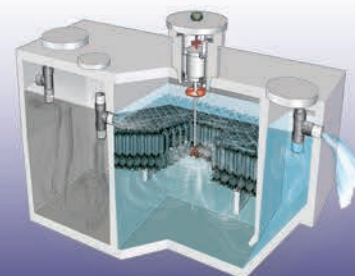
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Franklin Electric VP named to Hydraulic Institute's board of directors

DeLancey Davis, vice president of Franklin Electric and president of North America Water Systems, was appointed to the Hydraulic Institute's board of directors.



DeLancey Davis

Loftness Specialized Equipment names territory manager

Blake Eavenson was named territory manager for Loftness Specialized Equipment. Eavenson will be responsible for growing the VMLogix product line.

Talbert Manufacturing appoints two vice presidents

Talbert Manufacturing promoted Jamie Myers to vice president of purchasing, and promoted Jim Hall to vice president of operations. Myers and Hall have more than 40 years' combined experience in the manufacturing industry.



Jamie Myers



Jim Hall

Virgo Fleet releases new catalog

Virgo Fleet, a retail supplier of truck accessories, released an 84-page product catalog. Buyers can browse items in the catalog on the company's website, virgofleet.com.

Septic Services names national sales manager

Septic Services named Mike Copeland as national sales manager. Copeland has more than 20 years of sales experience.



Mike Copeland

Hol-Mac Corporation announces expansion

Hol-Mac Corporation will add 40 jobs and invest \$5 million in expanding its operation in Bay Springs, Mississippi. A \$250,000 grant from the Mississippi Development Authority includes \$200,000 for equipment relocation and \$50,000 for workforce training. □



Ditch Witch backreamer

The Sandhog HD backreamer from Ditch Witch is compatible with the JT9, JT20, JT25 and JT30 horizontal directional drills and is designed for soft and sandy soils. Aggressive cutting, mixing and packing combine for more efficient pullback on the job. Carbide cutting teeth and spiral plates further improve pullback efficiency and lower torque while maximizing the capacity for fluid flow. A barrel-shaped body is designed to better sculpt a true-to-size bore path. Replaceable, hardened steel nozzles increase fluid flow flexibility. The backreamer is available in 2 3/4-inch shaft size with 2 IF threads and 3 1/4-inch shaft with 2 3/8 API threads ranging in diameter from 8 to 18 inches. 800/654-6481; www.ditchwitch.com. □

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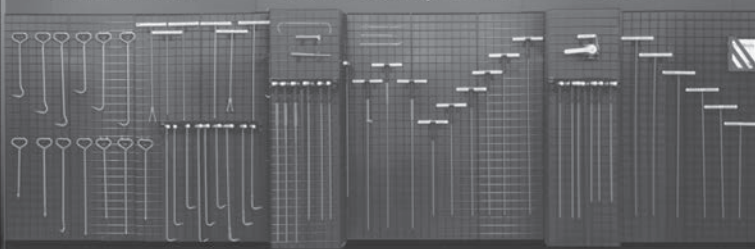


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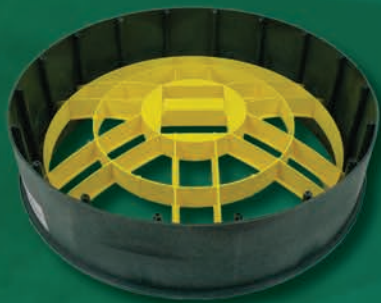
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